

## Severe Weather

### Thunderstorms

Small intense weather systems that produce strong winds, heavy rains, Lightning and thunder

Most occur along cold fronts

Need **warm, moist air and an unstable atmosphere**

1. The warm air rises around unstable cold air
2. The water vapor condenses as it cools and forms cumulus clouds
3. If the air is really unstable the warm air continues to rise to form a dark Cumulonimbus Cloud

Can produce: high winds, hail, tornadoes and flash floods- (quick flooding from heavy rains)

### Lightning

An electric discharge that occurs between a **positively charged area and a negatively charged area**

Can happen between two clouds, Earth and a cloud or even two parts of the same cloud

Releases energy

The energy is transferred to the air and causes the **air to expand rapidly and send out sound waves = Thunder**

Can produce power outages, fires, death and injury

## Tornadoes

A small spinning column of air that has high winds and a low central pressure and it touches the ground

Happen in 1% of thunderstorms

Form in Cumulus clouds

### Formation

1. Air moving in two directions causes a layer of air in the middle to spin
2. The spinning air is pushed upright (vertically) by strong updrafts of air
3. The spinning air moves to the bottom of the cloud and forms a funnel
4. When the funnel touches the ground it is a tornado

75% occur in the US

**\*\*Most happen in the spring and early summer. Tornado Alley – States in the mid west that are flat and in between the warm, moist air of the Gulf of Mexico and cold, dry air of Canada.**

## Hurricanes

A large rotating weather system with wind speeds of at least **74 mph**

Most powerful storms on Earth

Also called typhoons and cyclones in other parts of the World

**\*\*Strong over water, weak over land**

### Formation

1. Begin as thunderstorms over warm tropical waters
2. Winds from two different directions meet and cause the storm to spin
3. Becomes a Tropical Storm
4. The Coriolis Effect causes the storm to spin counterclockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere
5. Gains energy from the condensation of water vapor. The more warm air that rises, the more water vapor.
6. When winds reach 74mph it officially becomes a hurricane

7. Stays strong over water and weakens over land  
Meteorologists have gotten better at predicting and following hurricanes because of technology like satellites

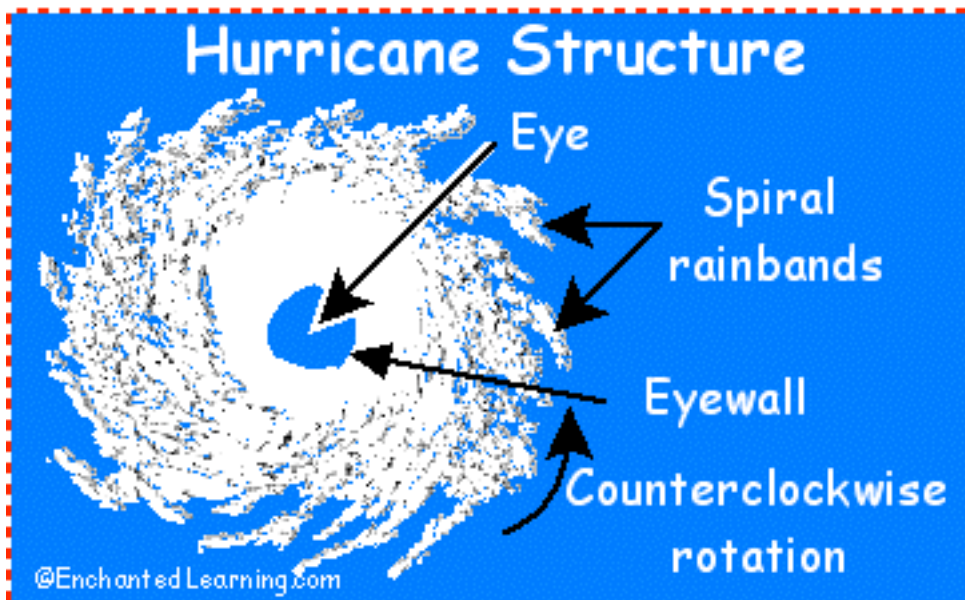
Hurricane Deaths have decreased over the years but property damage has increased. Why?

Parts

Rain Bands– outside layer that produce heavy rain and high winds

Eye Wall– the middle layer– heavy rains and high winds. The strongest part of the storm

Eye– The middle of the storm – warm calm air, low pressure and light winds



## **The Fujita Tornado Scale**

Category FO-- Gale Tornado Category 40 – 72 mph--Light damage: some damage to chimneys, breaks branches off trees, pushes over shallow-rooted trees, and damages sign boards.

Category F1-- Moderate Tornado Category 73 – 112 mph--Moderate damage: The lower limit Category 73 mph-- is the beginning of hurricane wind speed, peels surfaces of roofs, mobile homes pushed off foundations or overturned, and moving autos pushed off roads.

Category F2-- Significant Tornado Category 112 – 157 mph-- Considerable damage: Roofs torn off the frames of houses, mobile homes demolished, boxcars pushed over, large trees snapped or uprooted, and heavy cars lifted off ground and thrown

Category F3-- Severe Tornado Category 158 – 206 mph--Severe damage: Roofs and some walls torn off well-constructed houses, trains overturned, most trees in forest uprooted, and heavy cars lifted off ground and thrown.

Category F4-- Devastating Tornado Category 207 – 260 mph-- Devastating damage: Well-constructed houses leveled, structures blown off weak foundations, and cars and other large objects thrown about.

Category F5-- Incredible Tornado Category 261 – 318 mph--Incredible damage: Strong frame houses are lifted off foundations and carried a considerable distance and disintegrated, automobile sized missiles fly through the air in excess of 100 meters, and trees debarked.

Category F6+-- Inconceivable Tornado Category 319 – 379 mph--The maximum wind speed of tornadoes is not expected to reach the F6 wind speeds.

Tornadoes can be classified into one of three types:

Weak Tornadoes Category F0/F1-- These tornadoes account for 74% of all tornadoes. They cause less than 5% of tornado deaths. Their lifetime is usually 1 - 10+ minutes with wind speeds less than 113 mph.

Strong Tornadoes Category F2/F3-- These tornadoes account for 25% of all tornadoes. They cause nearly 30% of all tornado deaths and may last 20 minutes or longer. Their wind speeds are clocked between 113 and 206 mph.

Violent Tornadoes Category F4/F5-- These rare tornadoes account for less than 2% of all tornadoes. However, they cause 67% of all tornado deaths nationwide. They may last for one hour or more with wind speeds greater than 206 mph.

(Copied from <http://www.essdatarecovery.com/tornado.asp>)

## Tornado Safety

Tornado Watch – it may happen

Tornado Warning – it has been spotted

1. Get inside (If outside lay down completely flat, preferably in a ditch or open field)
2. Go to an interior room, closet or surrounded area on the first floor or basement Away from windows or any glass
3. Crouch down and cover your head
4. Afterwards, listen to the radio for an all clear
5. Avoid downed power lines and damaged structures
6. Use flashlights to inspect your area, do not use candles or matches (damaged gas lines)

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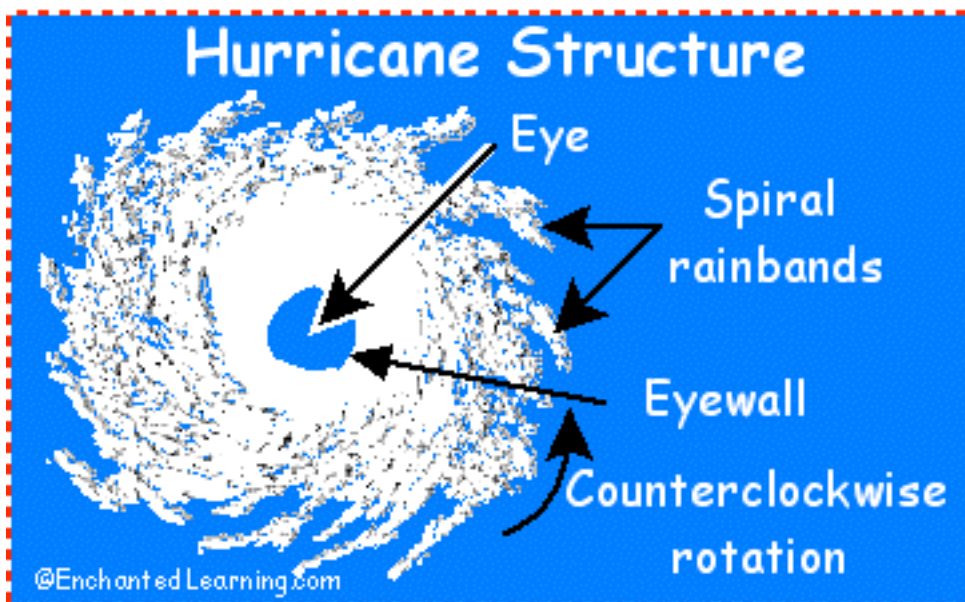
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<http://www.enchantedlearning.com/subjects/weather/hurricane/gifs/hurricanestructure.GIF>



## Categories of Hurricanes

<http://www.nhc.noaa.gov/aboutsshs.shtml>

## Naming Hurricanes

<http://kids.earth.nasa.gov/archive/hurricane/names.html>

## Hurricane Safety

<http://www.usatoday.com/weather/whurwrn.htm>